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# Dental caries and Intense training: A mine review

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## Abstract

**Purpose:** The purpose of this review study is to investigate dental caries and intense training. the oral health of athletes in various sports is inappropriate, so that athletes follow a downward trend with an increase in the incidence of various diseases of the oral cavity, performance during training and racing. **Method:** intense training has been identified as a harmful factor in the occurrence of a variety of oral diseases, including dental caries. **Results:** In this context, intense training plays a role as a negative factor in the development of dental caries in athletes by affecting various factors such as saliva PH and blood co2 in dental caries. **Conclusion:** In this regard, athletes need to be monitored by dentists, which seems to be effective in preventing the decline of athletes ' performance.

**Keywords:** Intense training, Dental Caries, athletes, oral cavity.

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## Introduction

Today, with the advancement of sports-related research, the benefits and harms of sports in the field of Health and Championship are also being revealed, and studies are also looking to clarify the harms of sports. Research showed that athletes should be aware of the risks associated with intense training so that they pay more attention to the health of their oral cavity because changes in the oral cavity contribute to the health and performance of athletes (Gallagher et al,2020).

Evidence showed that irregularities in your oral cavity with intense training have a significant impact on the quality life of athletes, In this way, the most common diseases of the oral cavity caused by exercise include dental caries. In addition, studies show that exercise intensity is effective in starting a race and training time as factors in causing oral cavity injuries (D'Ercole et al, 2016: Nieman et al,2002).

In this regard, studies have shown that athletes should be monitored by sports dentists in the field of oral cavity disorders and exercise and clinical examinations to be informed of the importance of dental health during intense training. In addition, the findings suggest that the implementation of intense training plays a role in the development of diseases of the oral cavity, such as dental caries. Therefore, the purpose of this study was to review the role of exercise on the Dental caries of athletes.

## Methods

In this mine overview study, a detailed search strategy was used to examine the effects of training intensity on dental caries. In this context the keywords intense training, Dentistry, Oral and dental diseases, dental caries, professional athletes were first identified and defined. These keywords were then used in combination using AND, OR operators to search reputable scientific databases such as Civilica, Noor Mags, Google Scholar, Magiran, PubMed, Medline, Irandoc, SID.

## Causes of Dental Caries

Dental Caries is a chronic disease among humans and is one of the most common global diseases in the mouth (Yadav et al,2016). So that it prevents the achievement of maintaining oral health in all age groups (Tean H et al,2005). dental caries refers to the local destruction of sensitive hard dental tissues by acidic byproducts from fermentation of food carbohydrate bacteria. It is caused by an ecological imbalance in the balance between dental minerals and oral biofilms (plaque) (Selwitz RH et al,2006, Nyvad et al,2007).

**Table 1:** Types of dental caries (Sonis et al,2003).

| Types of Decay | Description |
|---|---|
| Early rot | Decay in a place that has not experienced previous decay. |
| Secondary rot | Decay appears in a place with a previous history and is often seen on the margins of prolapses and other tooth restorations. |
| Stop or deactivate rot | Decay on a previously unsalted tooth so that it has been mineralized before re-cavity is formed. |

## Prevalence of Dental Caries

According to statistics released by international dental-related organizations, almost 2.43 billion people (about 36 percent of the population) worldwide have dental caries in their permanent teeth. So that in milk teeth it affects about 620 million people or 9% of the population. It is the most prevalent in Latin American countries, Middle Eastern countries and South Asia, and the least prevalent in East Asian countries in China. In the United States, tooth decay is the most common chronic childhood disease, at least five times higher than

asthma. In fact, this is the main pathological factor of tooth loss in children. In between 29 and 59 percent of adults over fifty experience rot (WHO,2009,2006، Vos,2012). Statistics on Iran show that each Iranian has at least 6 decayed teeth. Also, 87% of children under 6 have dental caries (Yılmaz, H, 2017).

## Methods Of Detecting Dental Caries

Early detection of dental caries is effective in reducing tooth structure loss and treatment costs and time required in tooth restoration. In the same context, conventional examinations for the diagnosis of Decay are carried out mainly by the method of visual, sensory and tactile examination and radiography (Tripodi, D,2021).

## Results

### Decayed, Missing, and Filled Teeth (DMFT)

The dental caries index is known worldwide in the 1930s. This indicator indicates decayed, lost and overflowing teeth. For example; a person with two decayed teeth; three teeth and one missing tooth has 6 DMFT. It is also important to note that the DMF score is a count that does not indicate the number of teeth at risk or the number of healthy teeth. In addition, DMF does not distinguish between a combination of decayed, lost and filled teeth and whether the teeth have been lost for reasons other than decay. Therefore, the validity of the DMF is reduced. All teeth are included with the exception of third grinding teeth, so for adults, DMFT ranges from zero to 28 and DMFS ranges from zero to 128 with grinding and permolar teeth having 5 surfaces and grinding and bite teeth having 4 surfaces. This indicator calculates for teeth that have been repaired; and removed and teeth that have been decayed. DMF is irreversible so that a person'S DMF score cannot be reduced, For population-based metrics, the sum of the DMFT/S scores is divided

by the number of people in the entire sample. It is important to note that the DMF count is very deviated by the zero state, and when the DMF number is a dependent variable, linear models are usually not suitable. Although DMF offers an indicator of the present and past decay experience, individual variables (decayed / lost / filled) can be separated in the data collection process. One limitation of the DMFT index is that DMF gives the same weight to decayed teeth and well restored teeth. The DMF index has rules that apply to the scoring of an individual tooth or surface. Each tooth (DMFT) or surface (DMFS) may be counted only once, and decay, even secondary decay, is preferred over filled teeth/surfaces (Klein H,1938, Lewsey,1999).

## Discussion

### Exercise and Dental Caries

Research literature in this area suggests, Huttunen et al. (2022), in a study examined the association between tooth decay and physical activity in male Finnish conscripts. The cross-sectional study was conducted in 20 garrisons (from the 24th garrisons) of the Finnish Defence Force. In addition, 13,564 male soldiers participated in the study to evaluate clinical examinations and fitness tests. The findings showed that good fitness was associated with a decrease in tooth decay. Needle et al. (2014), in research conducted on young professional athletes. The findings showed that exercise is a risk factor in the onset of oral diseases. In the same context, tooth decay disease accounted for 15-70% among the most common diseases. Ferris et al. (2014) evaluated the effect of endurance training on tooth decay in a study. In this study, participants were divided into two groups: athletes (35 people) and control (35 people). The results of the study showed that although there was no significant difference in the incidence of decay, there was a direct correlation between the weekly training hours of athletes and their tooth decay index, so that the increase of 1 hour of

weekly training increased the amount of the decay index (Needleman et al,2014). Bryant et al. (2011), in a study of tooth decay examined New Zealand's elite triathletes. The study divided participants into two groups of professional elite triathletes and the control group. The results showed that the risk of elite triathletes developing tooth decay is high.

## Physiological mechanism between intense training and Dental caries

In this regard, research in the field of sports science shows that exercise plays a role in reducing PH and increasing blood Co2. On the other hand the decrease in saliva PH is related to the level of Co2 in the blood thus the level of Co2 in the blood increases after exercise and as a result a high concentration of blood Co2 is transferred to the saliva of the mouth which is effective in reducing the saliva PH. In the same context, when the saliva PH reaches below the value of 5.5, which is considered to be "critical PH", so that hydroxyapatite crystals begin to dissolve and de-calcified areas are formed. In addition, factors that can cause a decrease in PH in athletes include inadequate oral hygiene habits, acidic saliva pH, and frequent consumption of acidic sports drinks (Tanabe-Ikegawa et al, 2018, Beyranvand et al, 2023).

## Conclusion

It seems that athletes should observe oral hygiene requirements (brushing during the day; visiting the dentist every 6 months) ؛ In addition, they are aware of the biochemical mechanisms and other factors that lead to dental caries, which is an effective factor in reducing performance during training and racing؛ Also, among various sports, athletes in sports with a millisecond competitive nature such as track and field (Endurance) require more attention to their oral cavity .

## Conflict of interest

The authors declare that there is no conflict of interest.

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